Exploring methods for combining altimetry with other data to extend the 20-year altimetric record onto a 50 year timescale

Svendsen, Peter Limkilde; Andersen, Ole Baltazar; Nielsen, Allan Aasbjerg; Knudsen, Per

Publication date:
2012

Document Version
Publisher's PDF, also known as Version of record

CONTROL ID: 1494218

TITLE: Exploring methods for combining altimetry with other data to extend the 20-year altimetric record onto a 50 year timescale

AUTHORS (FIRST NAME, LAST NAME): Peter Limkilde Svendsen[1], Ole Baltazar Andersen[1], Allan Aasbjerg Nielsen[1], Per Knudsen[1]

INSTITUTIONS (ALL): 1. DTU Space, Kgs. Lyngby, Denmark.

ABSTRACT BODY: Ocean satellite altimetry has provided global sets of sea level data for the last two decades, allowing determination of spatial
patterns in global sea level. For reconstructions going back further than this period, tide gauge data can be used as a proxy
for the model. We examine different methods of combining satellite altimetry and tide gauge data using optimal weighting of
tide gauge data, linear regression and EOFs, including automatic quality checks of the tide gauge time series.

We attempt to test the sensibility of reconstruction using known and existing datasets and to test the important of augmenting the model using various proxies such as climate indices like the NAO and PDO. We will also investigate alternative
transformations such as maximum autocorrelation factors (MAF), which better take into account the spatio-temporal structure
of the variation. Whereas a traditional EOF analysis tries to explain as much variance as possible, the MAF transform
considers noise to be uncorrelated with a spatially or temporally shifted version of itself, unlike the desired signal which will
exhibit autocorrelation. For the application to global dataset it is necessary to consider and account for wrap-around of spatial shifts.
Parameters from physical oceanography will be incorporated using ocean models (i.e., DRAKKAR; SODA) for a preliminary reference.
Our focus is on a timescale going back approximately 50 years, allowing reasonable global availability of model and tide gauge data. This allows for better sensitivity analysis with respect to spatial distribution, and tide gauge data.

KEYWORDS: [1641] GLOBAL CHANGE / Sea level change, [1637] GLOBAL CHANGE / Regional climate change.

(No Image Selected)

(No Table Selected)

Additional Details

Previously Presented Material:

Contact Details

CONTACT (NAME ONLY): Peter Svendsen

CONTACT (E-MAIL ONLY): plsv@space.dtu.dk

TITLE OF TEAM:
